

What is claimed is:

1. A field-effect transistor comprising:

a gate electrode formed at one side of a base substrate;

5 a source electrode formed at the one side of the base substrate;

a drain electrode formed at the one side of the base substrate;

10 an insulation layer formed between the gate electrode and the source electrode and between the gate electrode and the drain electrode;

a semiconductor layer formed around the source electrode and the drain electrode; and

15 a functional layer provided so as to come into contact with the semiconductor layer and containing electron acceptors.

2. The field-effect transistor according to claim 1, wherein the electron acceptor has a half-wave reduction potential of -0.46 V or higher.

20 3. The field-effect transistor according to claim 1, wherein the electron acceptor is a  $\pi$ -conjugate molecule composed of an ethylene molecule or a  $\pi$ -conjugate structure whose carbon number is 3 to 15 to which at least one group of -CN, -NO<sub>2</sub>, -F, -Cl, -Br, -I, and =O is linked.

4. The field-effect transistor according to

claim 3, wherein the  $\pi$ -conjugate structure has a carbon number of 3 to 15 and in which a heterocycle including an S atom as a heteroatom is formed.

5        5.    The field-effect transistor according to claim 1, wherein the thickness of the functional layer is 0.5 to 500 nm.

6.    The field-effect transistor according to claim 1, wherein the functional layer satisfies  
10    the following expression (1);

$$d2 \times 0.001 \leq d1 \leq d2 \times 1 \dots (1)$$

where  $d1$  denotes the thickness of the functional layer and  $d2$  denotes the thickness of the insulation layer.

15    7.    The field-effect transistor according to claim 1, wherein the concentration of the electron acceptors contained in the functional layer is 0.01 to 10 mass%.